

BULLETIN NO. 185
ISSUE I
AUGUST, 1944

TELETYPE

PRINTING TELEGRAPH SYSTEMS

DESCRIPTION AND ADJUSTMENTS
MULTIPLE TRANSMITTER DISTRIBUTORS
AND BASE
(MXD8, MXD9, AND MX88)

TELETYPE
CORPORATION
SUBSIDIARY OF
Western Electric Company
CHICAGO, U.S.A.

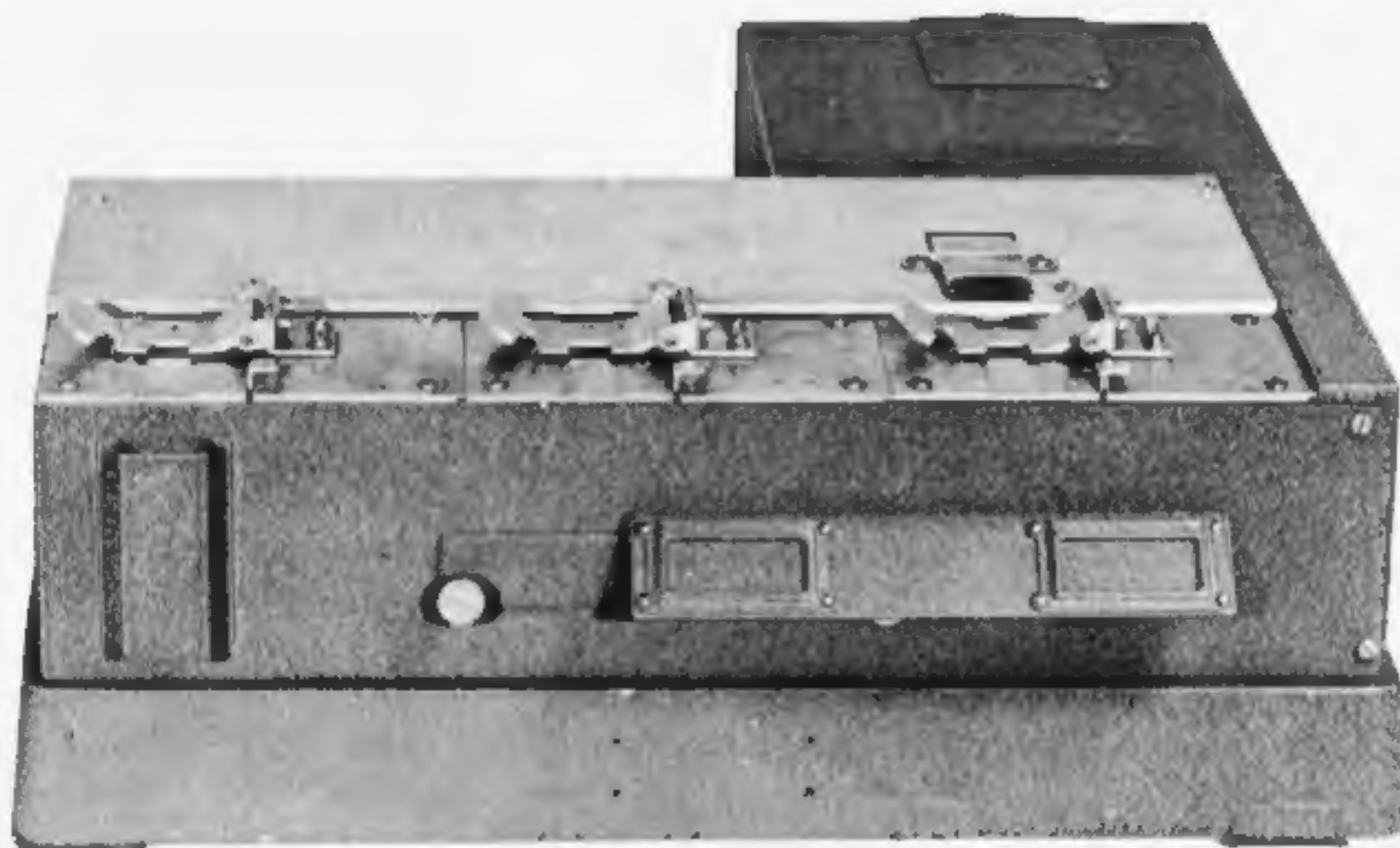
BULLETIN NO. 185
ISSUE 1
AUGUST, 1944

TELETYPE

PRINTING TELEGRAPH SYSTEMS

DESCRIPTION AND ADJUSTMENTS
MULTIPLE TRANSMITTER DISTRIBUTORS
AND BASE
(MXD8, MXD9, AND MXB8)





CONTENTS

DESCRIPTION	Page
General	1
Message Transmitter (MXD8)	1
Multiple Transmitter Distributor Base (MXD8)	3
Number Transmitter (MXD9)	3

ADJUSTMENTS

General	5
Multiple Transmitter Distributor (MXD8 and MXD9)	5
Armature Spring Tension	6
Clutch Adjustment	5
Clutch Spring Compression	5
Comb Shaft Retainer Adjustment	6
Feed Pawl Arm Spring Tension	10
Feed Pawl Lever Adjustment	10
Feed Pawl Spring Tension	10
Feed Wheel Adjustment	8
Feed Wheel Detent Adjustment	9
Feed Wheel Detent Spring Tension	10
Letters Operating Lever Horizontal Extension Adjustment	11
Letters Operating Lever Horizontal Extension Spring Tension	11
Release Bar Contact Adjustment	7
Release Bar Spring Tension	8
Selector Lever Bail Adjustment	9
Selector Lever Bail Spring Tension	9
Selector Lever Comb Adjustment	8
Selector Lever Guide Adjustment	9
Selector Lever Spring Tension	9
Stop Magnet Bracket Adjustment	6
Tape Lid Horizontal Adjustment	10
Tape Lid Latch Spring Adjustment	11
Tape Lid Latch Spring Tension Adjustment	11
Tape Lid Pivot Screws Adjustment	10
Tape Lid Vertical Adjustment	10
Tape-out Contact Gap Adjustment	7
Tape-out Contact Lever Latch Adjustment	6
Tape-out Contact Lever Latch Spring Tension	7
Tape-out Contact Spring Pressure	7
Tape-out Operating Lever Spring Tension	7
Tape-out Sensing Lever Spring Tension	9
Top Plate Adjustment	8
Transmitting Cam Cylinder End Play Adjustment	5
Transmitting Contact Gap Adjustment	6
Transmitting Contact Spring Pressure	6

- B -
(B-185)

	Page
Multiple Transmitter Distributor Base (MTDB)	12
Distributor Unit Position Adjustment.	15
Gear Guard Adjustment	14
Governor Adjusting Bracket Adjustment	14
Governor Brush Spring Plate Bracket Adjustment.	13
Governor Brush Spring Pressure.	13
Governor Shims Adjustment	14
Inner and Outer Disc Contact Spring Adjustment.	13
Main Shaft Bearings Alignment	12
Main Shaft End Play Adjustment.	12
Motor Gear Clearance Adjustment	14
Motor Pinion Adjustment	12
Release Bar Latch Adjustment.	12
Speed Adjusting Lever Stop Plate Adjustment	14
Speed Adjusting Wheel Friction Washer Spring Tension Adjustment . . .	12

LUBRICATION

Individual Multiple Transmitter Distributor Units.	15
Motor.	16
Parts on Base.	15

DESCRIPTION

GENERAL

The multiple transmitter distributor set is a mechanism which, when used in combination with reperforators, provides combined sending and receiving facilities for tape message relaying. A complete set consists of three multiple transmitter distributor units and a motor unit mounted on a base which is equipped with cross shaft, gears and terminal strips. (See Figures 1 & 2.) Two of these units are message transmitters and the third is a number transmitter. The function of the number transmitter is to insert automatically into the signal line successive numbers, from a number tape, which will identify each message before it is transmitted. The number transmitter is like the message transmitter except that it is equipped with a letter sensing mechanism which makes it responsive to the letters combination in the number tape causing stoppage of the number transmitter and starting of a message transmitter through external electrical control circuits.

The multiple transmitter distributors (message or number transmitters) are arranged to handle either perforated or chadless tape received from other stations on reperforators, or prepared locally on keyboard perforators.

MESSAGE TRANSMITTER (MXD-8)

NOTE: Because of the close similarity which exists between the two units, Figures 3 and 4, illustrating the number transmitter (MXD-9), will be referred to in the description of the message transmitter (MXD-8).

The message transmitter consists essentially of the following mechanisms: a 7.42 unit code transmitting cam cylinder with associated transmitting contacts, a tape feed and tape sensing mechanism, a hinged tape lid, an automatic tape out control feature, a manual control mechanism, a magnet operated clutch, a driven gear, and a transmitting contacts filter. (See Figures 3 and 4.) This unit is geared for transmission at the speed of 368.1 c.p.m.

The transmitting cam cylinder is normally held stationary because the clutch members on the transmitting shaft are held disengaged by the clutch throwout lever (Figure 3). When the clutch magnets are energized, the clutch members engage and the rotation of the transmitting cam cylinder begins the cycle of operation.

The transfer of the code combination in the perforated tape to the contact levers which control the transmitting contacts is accomplished by means of the selector lever bail (Figure 4), its cam, selector pins and selector levers.

The selector lever bail extension roller (Figure 6) rises from the indent on its cam and causes the selector lever bail to move away from the selector levers. The selector lever springs pull the selector levers up toward the tape. The selector pins which encounter perforated holes in their path advance through the perforations, but the pins which do not encounter perforations as they come in contact with the tape, are blocked by the tape and are

prevented from advancing farther.

Each selector lever is positioned, through the medium of the perforations in the tape, to correspond with each signal impulse to be transmitted. Each selector lever controls the motion of a contact lever either by allowing the contact lever to close its contact when the cams revolve, or by restricting the motion of the contact lever. If the selector pin does not enter a perforation in the tape, corresponding to a spacing impulse, the lower end of the selector lever engages the associated contact lever and prevents it from rising into an indent of the cam, as the cam rotates, thus holding the circuit open for that impulse. If the selector pin enters a perforation in the tape, corresponding to a marking impulse, it does not interfere with the movement of the contact lever. Then, as the cam revolves, the contact lever rides on the cam periphery and drops into an indent, thereby allowing its contact to close and send out a marking impulse. As the cams rotate, the impulses, either marking or spacing, are transmitted in succession. (See Figure 6 for location of parts.)

The start-stop cam controls a contact lever which, in turn, actuates the start-stop contacts (Figure 3.) These contacts are opened at the beginning of each revolution of the cam cylinder to transmit the start impulse (spacing) and remain open during the transmission of the five impulses. After the fifth impulse has been transmitted, the start-stop contacts again close, sending the stop impulse (marking) to the line.

After the fifth impulse has been transmitted, the selector lever bail extension (Figure 6) drops into the indent in its cam causing the selector lever bail to retract all the selector levers from their sensing position. At this moment the feed pawl arm roller drops into the indent in its cam and the feed pawl (Figure 4) engages the feed wheel ratchet, stepping it forward, thereby advancing the tape one character space over the selector pins. A feed wheel detent (Figure 4) establishes the relative setting of the feed wheel.

The transmitting cam cylinder rotates continuously as long as the clutch magnets are energized. An interruption of the clutch magnet circuit causes the clutch throwout lever to engage the cammed surface of the driven member of the clutch due to the action of the clutch throwout lever spring and, as the transmitting shaft rotates, the driven clutch member is cammed out of mesh with the driving member.

Within the unit there are two provisions for interrupting the clutch magnet circuit. The clutch magnets are connected in series with a set of automatically operated contacts and a set of manually operated contacts (Figure 4). The opening of either set of contacts stops the unit.

(A) AUTOMATICALLY OPERATED TAPE OUT CONTACTS (Figure 9)

The automatic contacts are a function of the tape out feature. The unit has a tape out sensing lever which operates in unison with the other five selector levers. The associated sensing pin (Figure 8-B) is in line with and adjacent to the sensing pin for the first impulse. It has a larger sensing area and a portion of it senses along the edge of the tape during the transmission of each character. When the end of the tape has passed through the transmitter the tape out sensing lever rises. Under this condition the lower end of the tape-out sensing lever does not interfere with the movement of its associated tape-out operating lever and this lever, in turn, is permitted to

ride on its cam periphery. When it drops into the cam indent, a pin on the tape-out operating lever engages the tape-out contact lever, thus rotating it about its pivot until at one end of the lever the automatic contacts are opened, and on the other end, the lever is latched by the tape-out contact lever latch. This interruption of the clutch magnet circuit by the opening of the automatic contacts stops the transmitter unit and renders it inoperative.

(B) MANUALLY OPERATED TAPE OUT CONTACTS (Figures 3 and 4)

The manually operated contacts are controlled by depressing the release bar. The bar may be depressed momentarily or it may be latched in the depressed position with a slight forward pressure. Operation of the release bar accomplishes three functions: opening of the manual contacts to stop the transmitter, unlatching of the tape-out contact lever thereby closing the tape out contact, and the disengaging of the feed wheel detent and the feed pawl which permits the feed wheel to spin freely to aid in the insertion or alignment of tape over the feed pins. When the release bar is released the manual contacts close and the transmitter operates.

The transmitter is equipped with a hinged tape lid (Figure 3) which permits the use of perforated or chadless tape without altering its adjustments. Tape is inserted directly under the latched lid after depressing the release bar. For inserting tape loops, the lid may be unlatched.

NUMBER TRANSMITTER (MXD-9)

The functions of the number and message transmitters are identical with the exception of the letters sensing mechanism which is a feature of the number transmitter.

LETTERS SENSING MECHANISM (Figure 13)

The letters sensing mechanism is used to stop the number transmitter and to start one of the message transmitters when the letters combination is sensed in the tape.

During every operating cycle, when the selector lever pins are sensing the code combination in the tape, a letters operating lever senses the ends of the five selector levers. If one or more selector levers are in the spacing position, the letters operating lever is prevented from continuing its travel. If the code combination is letters (all marking impulses), the letters operating lever is not blocked by any of the selector levers and therefore is rotated through a larger angle. The letters operating lever has two extensions, one of which rides on a cam and permits the letters operating lever to sense the selector levers, while the other engages the tape-out contact lever when a letters combination is sensed in the tape and consequently opens the tape-out contacts. These contacts are opened momentarily since the tape-out contact lever latch is disabled in the number transmitter. The momentary opening of these contacts causes the number transmitter to stop and starts one of the message transmitters by means of an external electrical control circuit.

MULTIPLE TRANSMITTER DISTRIBUTOR BASE (MXB-8)

The multiple transmitter distributor base has facilities for mounting a motor unit and three transmitter units. The number transmitter is mounted on the left side and the two message transmitters are in the middle and right

sides (See Figures 1 and 2). A series governed motor is used for operation on 115 volts D.C. or A.C., 50 or 60 cycles. The motor is demountable as a complete unit and is equipped with a governor filter (See Figure 2).

The motor power is transmitted to the individual units through a cross shaft (Figure 2). Each transmitter unit has an individual terminal strip to facilitate disconnecting the transmitter cable to remove the units. Underneath the base are the governor circuit elements, a terminal block for external power connections and three sets of spark protectors for the automatic and manual contacts on the three transmitter units. A two-conductor power cord and an eight-conductor cable, which terminate in plugs, provide facilities for external connections.

A complement of covers provides dust protection. Although the various sections of the covers are removable, a lid is provided in the motor cover which may readily be opened to provide a view of the speed target and access to the speed adjusting members. A guard is provided on the cover in front of the number transmitter through which the number tape will pass and be protected from damage from external sources. A tape chute is provided to direct the used tape from the unit on the right.

The front of the base is equipped with a card holder.
(See Frontispiece.)

ADJUSTMENTS

GENERAL

This bulletin contains requirements and adjusting procedures for the maintenance of multiple transmitter distributors (MXD-8 and MXD-9) and their base MXB-8). Adjustments are arranged in a sequence which would be followed if a complete readjustment of a unit were undertaken. In following such procedure, parts or assemblies which are removed to facilitate adjustment should not be replaced until all other adjustments which would be facilitated by the removal of these parts are made. If one adjustment is changed, related adjustments should be checked because a change in one adjustment may affect related adjustments. These facts should be kept in mind when a single adjustment is to be made.

The spring tension values given in this bulletin are scale readings which should be obtained when Teletype scales are used as specified. Springs which do not meet the requirements specified and for which no adjusting procedure is given should be replaced by new springs.

Before proceeding to adjust any part, read the description of the adjustment carefully. After the adjustment is completed, be sure to tighten any screws or nuts which may have been loosened. If a part that is mounted on shims is to be dismantled, the number of shims used at each of its mounting screws should be noted so that the same shim pile-ups can be replaced when the part is remounted.

NOTE: In all figures of this bulletin, fixed pivot points are designated by solid black circles.

MULTIPLE TRANSMITTER DISTRIBUTOR (MXD-8 AND MXD-9)

TRANSMITTING CAM CYLINDER END PLAY ADJUSTMENT (Figure 5)

The transmitting cam cylinder should have some end play, not over .002". To obtain this requirement, add or remove shims between the transmitting cam cylinder and the side frame bearing. Further refine this adjustment by positioning the clutch driving member on the transmitting shaft.

CLUTCH SPRING COMPRESSION (Figure 5)

With the clutch teeth engaged, insert a 32 oz. scale through the hole in the side frame and hook it over the clutch driven member projection and pull directly in line with the shaft. It should require 9 to 12 ozs. to separate the clutch teeth.

CLUTCH ADJUSTMENT (Figure 5)

There should be .005" to .015" clearance between the clutch teeth when the clutch is fully disengaged. To obtain this requirement, position the clutch throwout lever by adding or removing shims between the shoulder on the throwout lever post and the side frame.

STOP MAGNET BRACKET ADJUSTMENT

With the magnet armature held against the magnet cores, there should be .004" to .012" clearance between the clutch throwout lever and the high part of the cam on the clutch driven member. To adjust, loosen the stop magnet bracket mounting screws and position the bracket. Tighten the mounting screws. See Figure 5 for location of parts.

ARMATURE SPRING TENSION

With the clutch throwout lever on the low part of the clutch driven member, unhook the armature spring from the spring post and hook an 8 oz. scale in the spring eye. It should require 2 to 3-1/2 ozs. to extend the spring to its operating position length. See Figure 5 for location of parts.

TRANSMITTING CONTACT GAP ADJUSTMENT (Figure 6)

With any contact lever on the high part of its cam, the contact gap should be *.020" to .025". To obtain this requirement, bend the shorter contact spring.

- * For start-stop contacts, the gap should be .015" to .025".

TRANSMITTING CONTACT SPRING PRESSURE (Figure 7)

With any contact lever on the low part of its cam, it should require a pressure of 4-1/2 to 5-1/2 ozs. to open the associated contact when the push end of an 8 oz. scale is applied to the longer contact spring just above the contact point. To obtain this requirement, bend the longer contact spring; recheck the contact gap adjustment.

COMB SHAFT RETAINER ADJUSTMENT

The comb shaft should be clamped by the retainers so that it rests at the bottom of the shaft slot.

NOTE: Before making this adjustment make certain that the side of the retainer in which the end of the slot is closest to the hole, is at the right.

To adjust, loosen the retainer clamp screw on each end of the comb and position each retainer in such direction that the eccentric slot in the retainer takes up the clearance between the shaft and the bottom of the shaft slot. Tighten the clamp screws. See Figure 8 for location of parts.

TAPE-OUT CONTACT LEVER LATCH ADJUSTMENT (Figure 9-A)

With the tape-out operating lever resting on the low part of its cam, there should be from .010" to .020" clearance between the latching surface of the tape-out contact lever latch and the tape-out contact lever. To adjust, loosen the tape-out contact lever latch mounting screw nut and position the mounting screw in the elongated hole of the bracket. Tighten the nut.

TAPE-OUT CONTACT LEVER LATCH SPRING TENSION (Figure 9-A)

With the tape-out operating lever resting on the low part of its cam and an 8 oz. scale hooked over the contact lever latch at the bottom of the notch, it should require 1/4 to 1 oz. to start the latch moving.

TAPE-OUT CONTACT GAP ADJUSTMENT

Before making this adjustment on transmitter distributor units having a mechanism for momentarily opening the tape-out contact on the LETTERS combination, disable the tape-out contact lever latch lockout screw (Figure 9-A) by moving it upward. Proceed with the adjustment as follows:

With the transmitting cam cylinder in its stop position (clutch teeth disengaged) and the tape-out contact lever in its latched position, the contact gap should be .020" to .025". To adjust, bend the shorter contact spring. See Figure 9 for location of parts.

TAPE-OUT CONTACT SPRING PRESSURE (Figure 9-B)

With the transmitting cam cylinder in its stop position (clutch teeth disengaged) and the tape-out contact lever in its unlatched position, it should require a pressure of 2 to 3 ozs. to open the contact when the push end of an 8 oz. scale is applied to the contact spring just above the contact point. To adjust, bend the longer contact spring; recheck the contact gap adjustment.

TAPE-OUT OPERATING LEVER SPRING TENSION (Figure 9-B)

With the transmitting cam cylinder in its stop position (clutch teeth disengaged) and the tape-out operating lever resting on the high part of its cam, hook the end of a 32 oz. scale over the top of the tape out operating lever. It should require a pull of 10 to 14 ozs. to start the lever moving away from the cam.

RELEASE BAR CONTACT ADJUSTMENT

- (1) With the release bar fully depressed, there should be a gap of .020" to .025" between the contact on the heavy short contact spring and the contact of the long contact spring (Figure 10-A). Adjust by bending the short heavy contact spring.
- (2) With the release bar in the unoperated position (up), it should require a tension of 2-1/2 to 3-1/2 ozs. to open the contacts when an 8 oz. scale is hooked over the long contact spring just above the contact point and pulled horizontally (Figure 10-B). To adjust, bend the long contact spring; recheck the contact gap adjustment.
- (3) With the release bar unoperated, there should be a gap of .010" to .015" between the contact of the short thin contact spring and the contact of the long contact spring (Figure 10-B). To adjust, bend the short thin contact spring stiffener.

- (4) With an 8 oz. scale hooked over the short thin contact spring at the contact point, it should require 2-1/2 to 3-1/2 ozs. to just start moving the spring away from the spring stiffener (Figure 10-B). To adjust, bend the short thin contact spring.

RELEASE BAR SPRING TENSION (Figure 10-B)

Apply the push end of an 8 oz. scale to the top of the release bar and push vertically downward. It should require 1-1/2 to 3 ozs. to start the release bar moving.

SELECTOR LEVER COMB ADJUSTMENT (Figure 6)

With the transmitting cam cylinder in its stop position, there should be a clearance of .002" to .012" between the lower ends of the selector levers and the horizontal extensions of the contact levers. To adjust, add or remove shims under the selector lever comb on each of the side frames. See Figure 5.

TOP PLATE ADJUSTMENT (Figure 6)

With the selector lever pins just flush with the top surface of the tape guide slot in the top plate, the lower ends of the five selector levers should overlap their contact levers by .050" to .090". To adjust, rotate the transmitting cam cylinder until the selector lever pins are flush with the top surface of the tape guide slot and shim the top plate at its four corners to obtain the proper overlap.

Before tightening the mounting screws, position the top plate so that the selector lever pins are aligned approximately on the center line of the slotted hole in the top plate, and so that the clearance is not less than .006" between the pins (Tape-out pin included) and the edges of the slotted hole.

FEED WHEEL ADJUSTMENT

- (1) The feed pins on the tape feed wheel should extend .035" to .045" above the top surface of the channel in the top plate. To adjust, insert shims between the feed wheel brackets and the bottom surface of the top plate.

The mounting screws should engage the top plate with the maximum number of threads without protruding through the surface. Adjust by inserting unused shims between the brackets and the clamp plates.

- (2) Position the tape feed wheel so that when a piece of perforated tape having perforations properly centered, is engaged by the feed wheel, there will be an equal amount of clearance between the sides of the tape guide slot in the top plate and the edges of the perforated tape. Adjust the feed wheel by means of the pilot screws. When adjusted, there should be some end play, not more than .002". Recheck adjustment (1). See Figures 8 and 11 for location of parts.

NOTE: If necessary, the accessibility of the right pilot screw may be improved by removing the hexagonal post on which the transmitter filter is mounted, and rotating the post and filter to the right.

SELECTOR LEVER BAIL ADJUSTMENT

Before making this adjustment on transmitter distributor units having a mechanism for momentarily opening the tape-out contact on LETTERS combination, move the letters operating lever (Figure 13) toward the front of the transmitter by means of its mounting stud and the slotted hole in the bracket. This is done so that the vertical projection of the letters operating lever will not interfere with the free movement of the selector levers.

With the selector cam sleeve in its stop position (clutch fully disengaged) and the selector lever bail extension roller resting on the low part of its cam, the highest selector lever pin should not project above the top surface of the tape guide slot in the top plate and should not be below the top surface by more than .010". See Figure 6 for location of parts. To adjust, insert a screw driver through a hole in the side frame, loosen the selector lever bail clamping screw (Figure 5) and position the selector lever bail with relation to its extension. Tighten the clamping screw.

SELECTOR LEVER BAIL SPRING TENSION (Figure 6)

With the transmitting cam cylinder in its stop position and the selector lever bail extension roller resting on the low part of its cam, place the push end of an 8 oz. scale against the selector lever bail extension directly above the spring and push in line with the spring. It should require at least 5 ozs. to start the bail moving.

SELECTOR LEVER SPRING TENSION (Figure 6)

With the selector lever pins in their uppermost position, apply the push end of an 8 oz. scale to the top of a selector lever pin and push vertically downward. It should require $3/4$ to $1-1/4$ ozs. to start the pin moving.

TAPE-OUT SENSING LEVER SPRING TENSION (Figure 9-A)

With the tape-out sensing pin in its uppermost position, apply the push end of an 8 oz. scale horizontally at the bend of the tape-out sensing lever just below the selector lever bail. It should require $1/2$ to $1-1/2$ ozs. to start the tape-out sensing lever moving.

FEED WHEEL DETENT ADJUSTMENT

With a piece of tape perforated with the LETTERS combination (checked for ten holes to the inch) in the transmitter, and the cam sleeve rotated until the selector lever pins are in the uppermost position, the pins should be approximately midway between the hinged edge and the trailing edge of the holes in the chadless tape.* To adjust, hold the feed pawl away from the ratchet and position the detent eccentric, keeping the high part of the eccentric toward the rear of the unit. See Figure 11 for location of parts.

* For perforated tape the pins should be centered in the perforations.

SELECTOR LEVER GUIDE ADJUSTMENT

When a piece of tape, perforated with the LETTERS combination and properly centered (having No. 1 and No. 5 code holes equidistant from the edges), is placed in the transmitter and the cam sleeve rotated until the

selector lever pins are in their uppermost position, the pins should be approximately in line with the center line through each hole in the perforated tape. To adjust, loosen the mounting screws of the selector lever guide and position the guide. Tighten the mounting screws. See Figure 6 for location of parts.

FEED WHEEL DETENT SPRING TENSION (Figure 11)

With the detent resting between two teeth on the feed wheel ratchet, hook a 32 oz. scale over the roller of the detent and pull parallel to the top plate. It should require 16 to 20 ozs. to start the detent moving.

FEED PAWL LEVER ADJUSTMENT

With the transmitting cam cylinder in the stop position, there should be a clearance of .010" to .040" between the feed pawl and the face of the second tooth below the horizontal center of the feed wheel ratchet. To adjust, loosen the clamp screw and position the feed pawl lever with respect to the feed pawl arm. Tighten the clamp screw. See Figure 11 for location of parts.

FEED PAWL ARM SPRING TENSION (Figure 11)

With the transmitting cam cylinder in the stop position and the feed roller resting on the low part of its cam, unhook the feed pawl spring from the feed pawl. With a 32 oz. scale hooked over the feed pawl arm in line with the spring hole and pulled at right angles to the feed pawl arm, it should require 24 to 28 ozs. to start the feed pawl arm moving. Replace the feed pawl spring.

FEED PAWL SPRING TENSION (Figure 11)

With the transmitting cam cylinder in the stop position, hook an 8 oz. scale over the lower part of the feed pawl, near the spring hole, and pull at right angles to the feed pawl. It should require 1/2 to 2 ozs. to start the feed pawl moving away from the ratchet wheel.

TAPE LID PIVOT SCREWS ADJUSTMENT (Figure 8-B)

The tape lid should be located centrally with respect to the tape lid bearing bracket and should be free to pivot, without binding, with a minimum amount of end play at the bearings. Adjust by means of the two tape lid pivot screws to meet the above requirements. Tighten the two lock nuts.

TAPE LID VERTICAL ADJUSTMENT (Figure 8-B)

The tape lid should rest flatly along both edges of the tape guide slot in the top plate. To adjust, loosen the two tape lid bearing bracket mounting screws and position the tape lid to meet the above requirement. Tighten the mounting screws.

CAUTION: In making this adjustment, make sure that the lowest section of the tape lid is within the tape guide slot of the top plate.

TAPE LID HORIZONTAL ADJUSTMENT (Figure 8-A)

The horizontal adjustment of the tape lid should meet the following requirements:

- (A) The feed wheel pins should line up centrally between the fins of the feed wheel pin slot in the tape lid.
- (B) With the selector lever pins in the upper position, there should be at least .006" clearance between the selector lever pins (tape-out sensing pin included) and any part of the tape lid.
- (C) The selector lever pins should be inside their slots and .010" to .015" from the end of the tape fins.

To adjust, loosen the tape lid bracket mounting screws (Figure 8-B) and position the tape lid to meet all three requirements. Tighten the mounting screws.

TAPE LID LATCH SPRING ADJUSTMENT (Figure 12)

The tape lid latch spring should be adjusted vertically so that the tape lid latches firmly. To adjust, loosen the tape lid latch spring mounting screws, position the spring up or down to meet the requirement, and tighten the mounting screws.

TAPE LID LATCH SPRING TENSION ADJUSTMENT (Figure 12)

With the tape lid latched, apply a 32 oz. scale at right angles to the uppermost bent section of the latch spring and push downward. It should require 12 to 16 ozs. to just start deflecting the spring. Adjust by gradually bending the spring approximately midway between its upper mounting hole and the top plate.

LETTERS OPERATING LEVER HORIZONTAL EXTENSION ADJUSTMENT (Figure 9-A)

Move the tape-out contact lever latch lockout screw upward so that it is ineffective. Set up the LETTERS combination and rotate the cam sleeve manually until the letters operating lever (Figure 13) is resting on the low part of its cam. With the letters operating lever in this position, there should be .010" to .020" clearance between the latching surface of the tape-out contact lever latch and the tape-out contact lever.

To adjust, loosen the horizontal extension clamping screw (Figure 13) and position the letters operating lever horizontal extension with respect to the tape-out contact lever. Tighten the extension clamping screw.

NOTE: After completing the "Letters Operating Lever Horizontal Extension Adjustment," make the tape-out contact lever latch ineffective by positioning the lockout screw downward so as to provide a clearance of at least .010" between the end of the tape-out contact lever and the tape-out contact lever latch.

LETTERS OPERATING LEVER HORIZONTAL EXTENSION SPRING TENSION (Figure 13)

With the letters operating lever resting on the high part of its cam, hook a 32 oz. scale over the vertical arm of the letters operating lever as close as possible to the selector lever and pull at right angles to the letters operating lever. It should require 10 to 14 ozs. to start the letters operating lever moving.

MULTIPLE TRANSMITTER DISTRIBUTOR BASE (MOB-8)

RELEASE BAR LATCH ADJUSTMENT

With the release bar fully depressed, there should be some clearance, not more than .010", between the release bar latch and the latching edge of the release bar. Adjust by bending the release bar latch.

When the release bar is latched and the release bar slot is fully engaging the release bar latch, there should be some clearance, not more than .010", between the slot in the release bar and the top plate. To adjust, loosen the release bar latch mounting screws and position the latch in its mounting holes.

NOTE: These adjustments should be made with the motor unit removed from the base casting. To remove the motor unit, disconnect the three wires from the motor unit at the terminal block, and remove the governor adjusting bracket. Remove the four screws which mount the two motor plates to the base casting, and remove the motor unit by lowering it through the base casting.

MAIN SHAFT BEARINGS ALIGNMENT (Figure 14)

The main shaft should turn freely in its bearings. Check throughout one complete revolution of the main shaft. To adjust, loosen the mounting screws of the two main shaft bearings. Align the bearings so that the shaft turns freely. If necessary, add or remove shims between either bearing and its base on the base casting. Tighten the mounting screws of both bearings.

MAIN SHAFT END PLAY ADJUSTMENT (Figure 14)

The main shaft should have some end play, not over .004". To adjust, loosen the two collar set screws and position the collar on the main shaft. Tighten the set screws.

MOTOR PINION ADJUSTMENT

The motor pinion should line up with the motor gear on the main shaft. To adjust, loosen the four motor mounting screws and position the motor on its mounting brackets. Tighten the mounting screws.

SPEED ADJUSTING WHEEL FRICTION WASHER SPRING TENSION ADJUSTMENT (Figure 15) SEE NOTE A

Turn the adjusting wheel so that the tension on the governor contacts is 13 to 14 ozs. Measure this tension by hooking a 32 oz. scale over the contact spring arm next to the contact and pulling parallel to the speed adjusting spring. To measure the pressure of the speed adjusting wheel

* * *

NOTE (A) These requirements should be checked with the governor adjusting bracket, the brush spring plate, and the governor cover removed.

friction washer, insert a bank pin in the leather rim (radially), hook a 32 oz. scale over the pin, at the periphery of the adjusting wheel, and pull at right angles to the radius. It should require 16 to 24 ozs. to start the wheel moving. To adjust this tension, remove the friction washer and bend the large projections.

INNER AND OUTER DISC CONTACT SPRING ADJUSTMENT (Figure 16) - SEE NOTE A

- (1) The distance from the inner surface of the governor cover to the highest point of the contact springs should be $25/32"$ to $27/32"$.
- (2) Place a D socket wrench over the nut, located in the center of the governor cover, which is used to hold the contact springs in place. With a suitable scale, measure the radial distance from the vertical surface of the wrench to the point where the scale touches the curved surface of the inner disc contact spring. The distance should be $17/32"$ to $19/32"$.
- (3) In a similar manner, measure the distance from the wrench to the point of contact on the outer disc contact spring. This distance should be $7/16"$ to $1/2"$.

Adjust by bending the inner and outer disc contact springs.

GOVERNOR BRUSH SPRING PLATE BRACKET ADJUSTMENT

The spring plate bracket should be positioned to meet the following requirements:

- (1) A line established by the center of the outer disc and the center of one of the brushes should pass through some portion of the other brush. (Figure 17-A).
- (2) The surface of the brush spring plate bracket, on which the brush spring plate is mounted, should be in line with the outer surface of that part of the governor cover on which the target is mounted (Figure 17-B).
- (3) The bracket should be parallel to the edge of the motor base plate.

To adjust, position the brush spring plate bracket by means of its enlarged mounting holes.

GOVERNOR BRUSH SPRING PRESSURE (Figure 17-B)

(A) INNER DISC BRUSH SPRING

Hook an 8 oz. scale over the inner disc brush spring just to the right of the carbon contact brush as viewed from the rear of the motor and pull horizontally away from the motor. It should require $4-1/2$ to $5-1/2$ ozs. to start the brush moving away from the disc.

* * *

NOTE (A) These requirements should be checked with the governor adjusting bracket, the brush spring plate, and the governor cover removed.

(B) OUTER DISC BRUSH SPRING

Apply an 8 oz. push scale against the outer brush spring, just to the right of the carbon contact brush as viewed from the rear of the motor and push horizontally toward the motor. It should require 4-1/2 to 5-1/2 ozs. to start the brush moving away from the disc.

To obtain the correct brush spring pressure, remove and bend the brush springs. When the springs are replaced and the spring pressure obtained, see that the contact brushes lie flat against their respective discs and that the outer edges of the brushes are either flush with or not more than 3/64" inside the outer edges of the discs.

GOVERNOR ADJUSTING BRACKET ADJUSTMENT (Figure 17-B)

There should be .020" to .060" clearance between the speed adjusting wheel and the speed adjusting surface of the bracket.

Adjust by bending the governor adjusting bracket.

SPEED ADJUSTING LEVER STOP PLATE ADJUSTMENT

There should be .006" to .050" clearance between the adjusting lever wearing strip and the governor when the adjusting lever is held against the stop plate.

To adjust, position the adjusting lever stop plate by means of its elongated mounting holes. See Figure 17-B for location of parts.

GOVERNOR SHIMS ADJUSTMENT (Figure 17-B)

With the governor speed adjusting lever in its unoperated position, there should be at least .006" clearance between the adjusting lever wearing strip and the speed adjusting wheel when the wheel is opposite the wearing strip, the wearing strip is tight against the casting, and all the end thrust of the motor armature is taken up in a direction to make this clearance a minimum. Adjust by means of shims placed on the armature shaft between the governor hub and the end frame casting of the motor. (If the wearing strip is not absolutely tight against the casting, bend it until it is.)

MOTOR GEAR CLEARANCE ADJUSTMENT

NOTE: Remount the motor unit on the base casting, replace the governor adjusting bracket, and reconnect the three motor wires.

There should be a barely perceptible amount of backlash between the motor pinion and the motor gear. This backlash should be checked throughout one complete revolution of the motor gear. To adjust, loosen the four mounting screws which clamp the two motor plates to the base casting, and add or remove shims between the motor plates and their bosses on the base casting. Tighten the mounting screws.

GEAR GUARD ADJUSTMENT

There should be some clearance, not more than 1/32" between the gear guard and the motor gear at the closest point, throughout one complete revolution of the motor gear. To adjust, loosen the

gear guard mounting screws and position the gear guard. Tighten the mounting screws.

DISTRIBUTOR UNIT POSITION ADJUSTMENT

Each unit should be positioned on the base so as to provide a minimum amount of backlash, without binding, between the driven gear on the unit and the driving gear on the main shaft. This backlash should be checked throughout one complete revolution of the gear. To adjust, loosen the three mounting screws and position the unit. Tighten the mounting screws.

NOTE: When the right hand unit is mounted and adjusted, there should be at least 1/8" clearance between the soldered connection on one of its connection lugs and the gear guard. Bend the connection lug away from the gear guard, if necessary, but do not short across the adjacent connection.

The oil and grease specified in the supplement furnished with this bulletin should be used to lubricate the transmitter distributors.

Unless otherwise specified, one or two drops of oil at each of the places indicated will be sufficient. Use oil for lubrication at all of the places listed in the following, except where the use of grease or oil-grease-oil is specified.

(A) INDIVIDUAL MULTIPLE TRANSMITTER DISTRIBUTOR UNITS

- (1) Selector cam assembly shaft - two oil cups
- (2) Clutch - sliding member
- (3) Cam felt oiler - Saturate felt with oil
- (4) Clutch throwout lever - bearings
- (5) Contact lever pivoting shaft
- (6) Gear - (grease)
- (7) Selector lever pivoting shaft and guiding comb - oil sparingly
- (8) Feed pawl lever roller - bearing
- (9) Feed pawl - bearing
- (10) Feed pawl ratchet
- (11) Feed roll - bearings - two
- (12) Feed wheel detent - bearing
- (13) Feed wheel detent roller - bearing and points of contact with feed pawl and release bar
- (14) Tape-out contact lever - guide slot in spring bar
- (15) Tape-out lever latch - bearing and point of contact with tape-out contact lever
- (16) Release bar - bearing and guide
- (17) Letters operating lever - bearing

(B) PARTS ON BASE

- (1) Gears - apply light film of grease
- (2) Main shaft - bearings - 3 holes in bearing mounting blocks
- (3) Main shaft driving gear - bearing oil hole

(C) MOTOR

- (1) Motor pinion - light film of grease
- (2) Motor bearing oiler - two
- (3) Motor speed lever - pilot screw

Oil both loops of all helical springs.

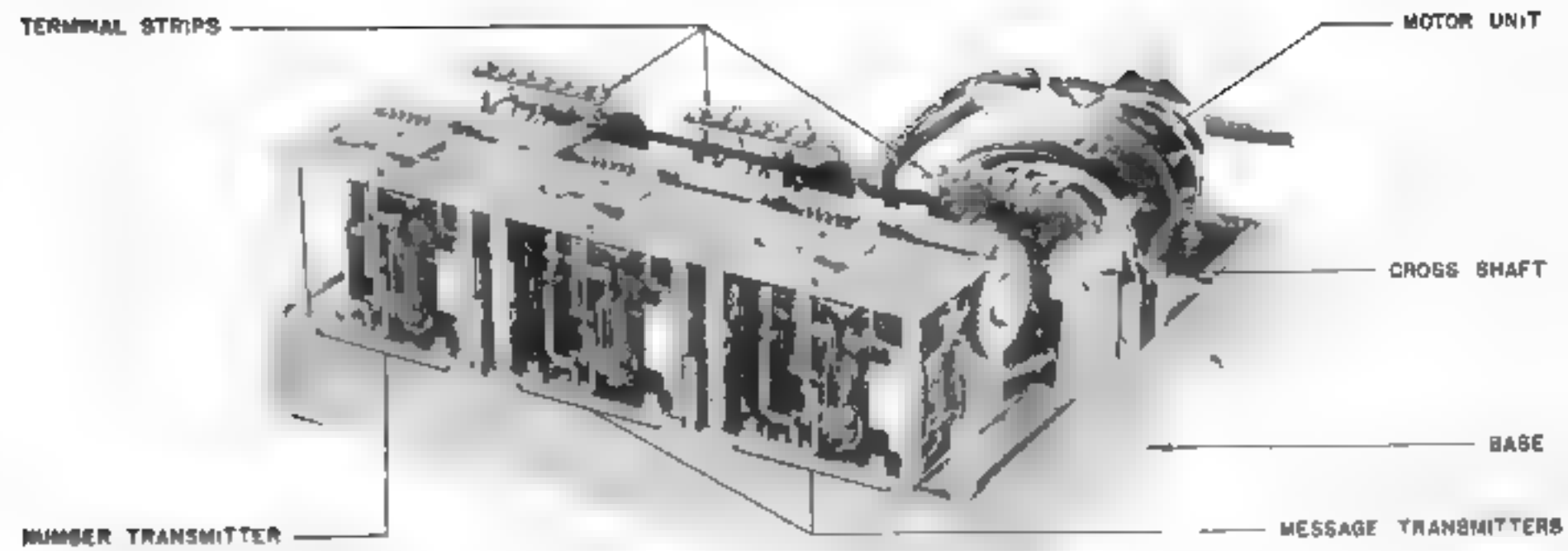


FIGURE 1

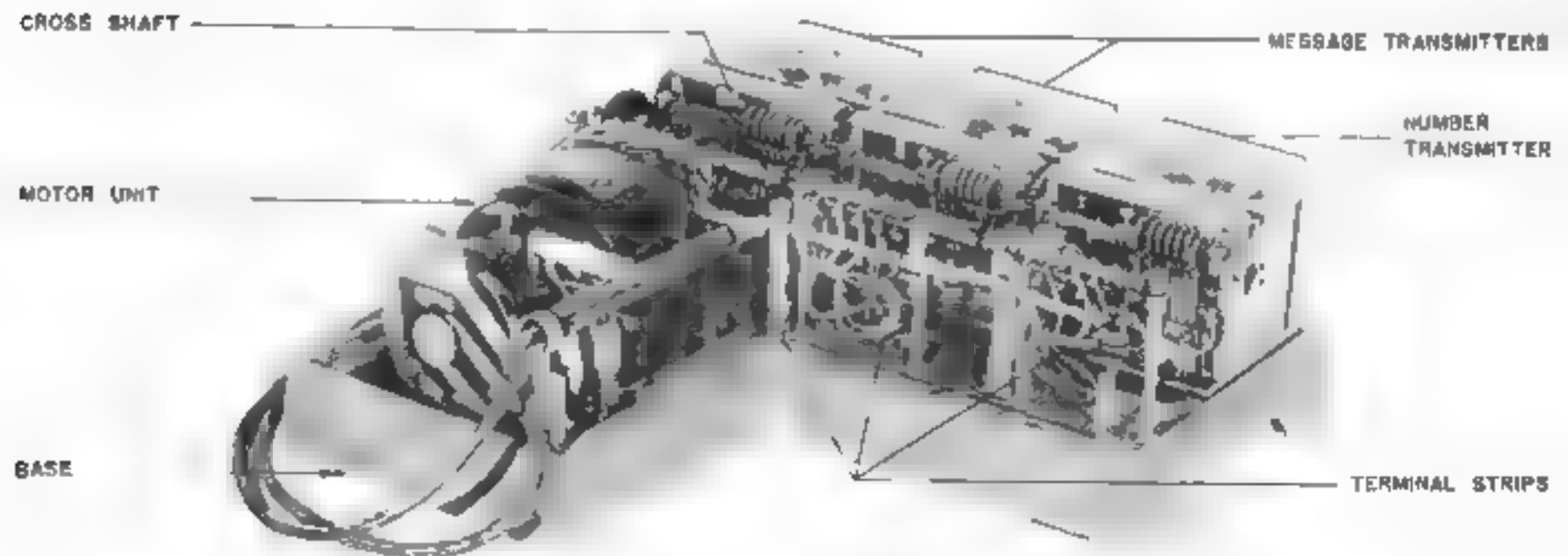


FIGURE 2

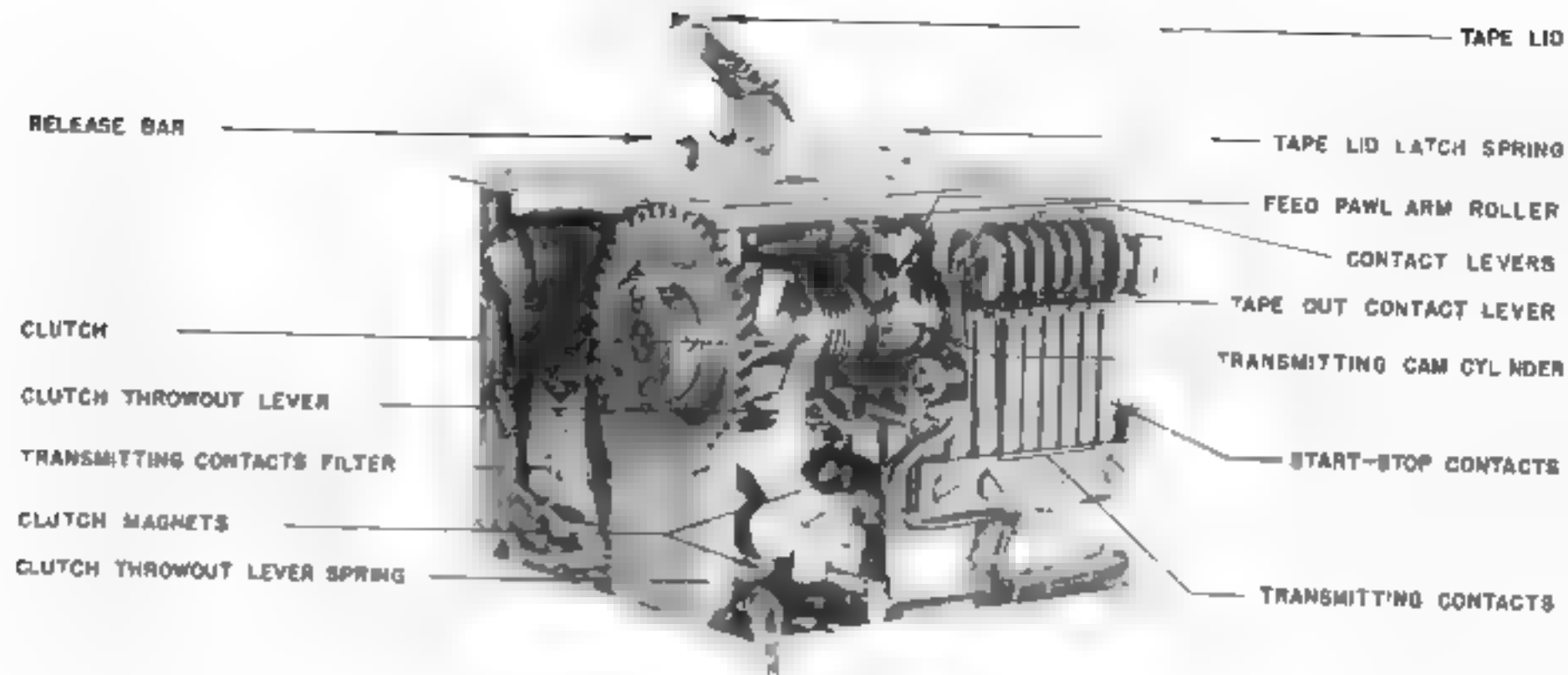


FIGURE 3

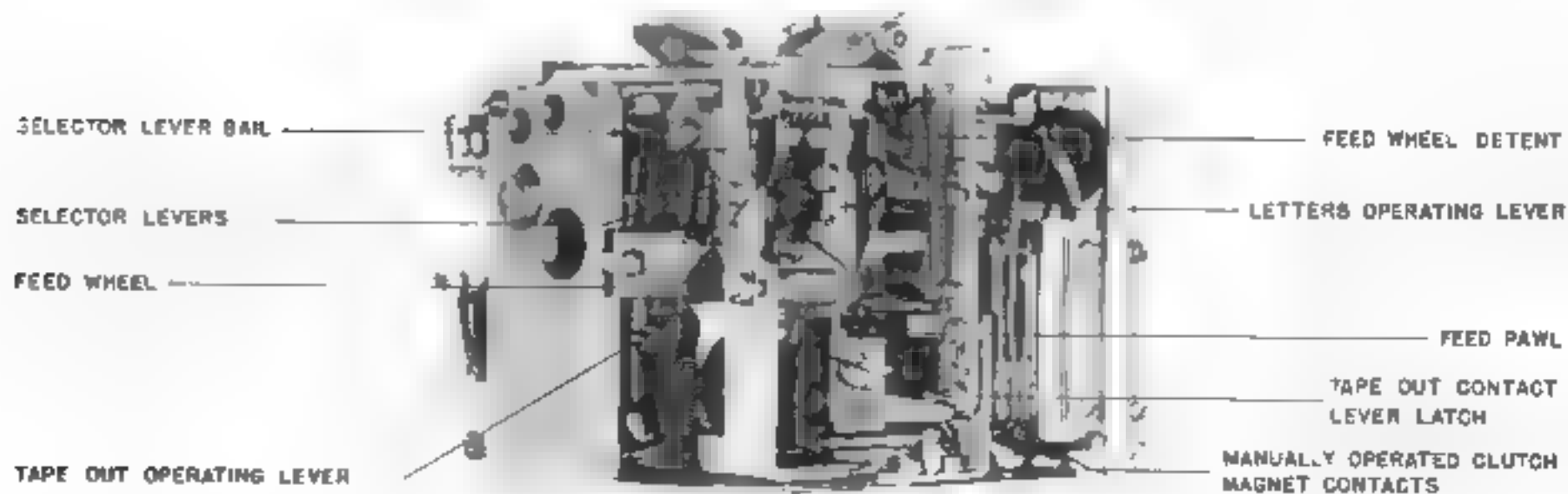
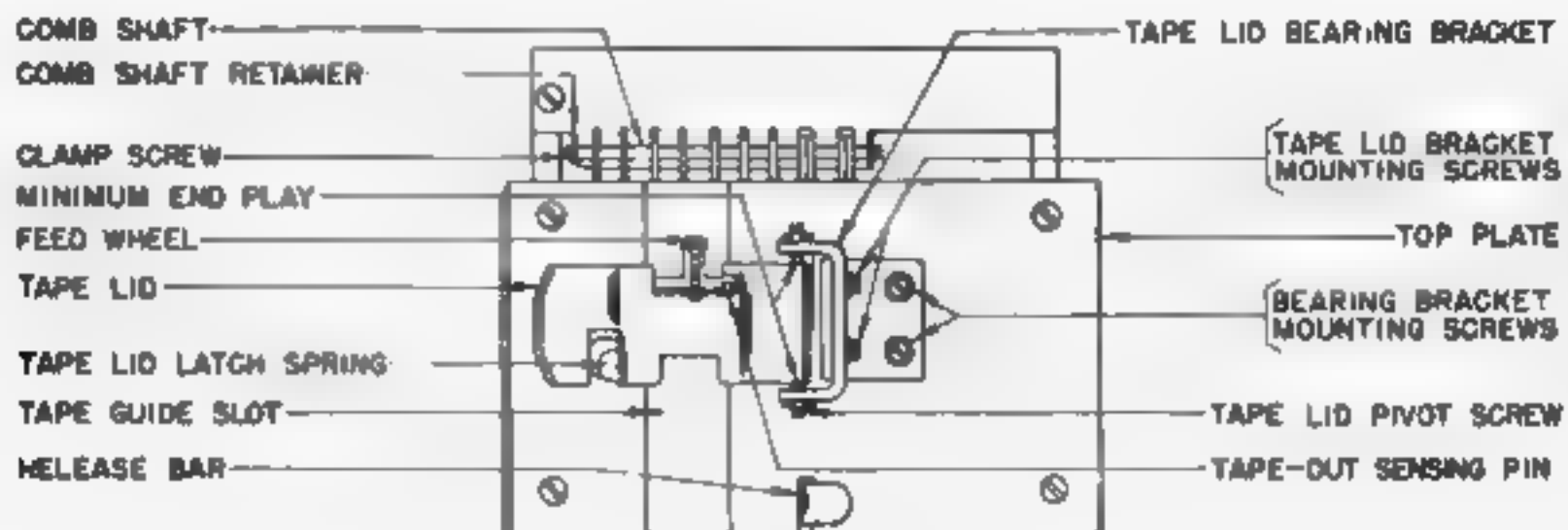


FIGURE 4

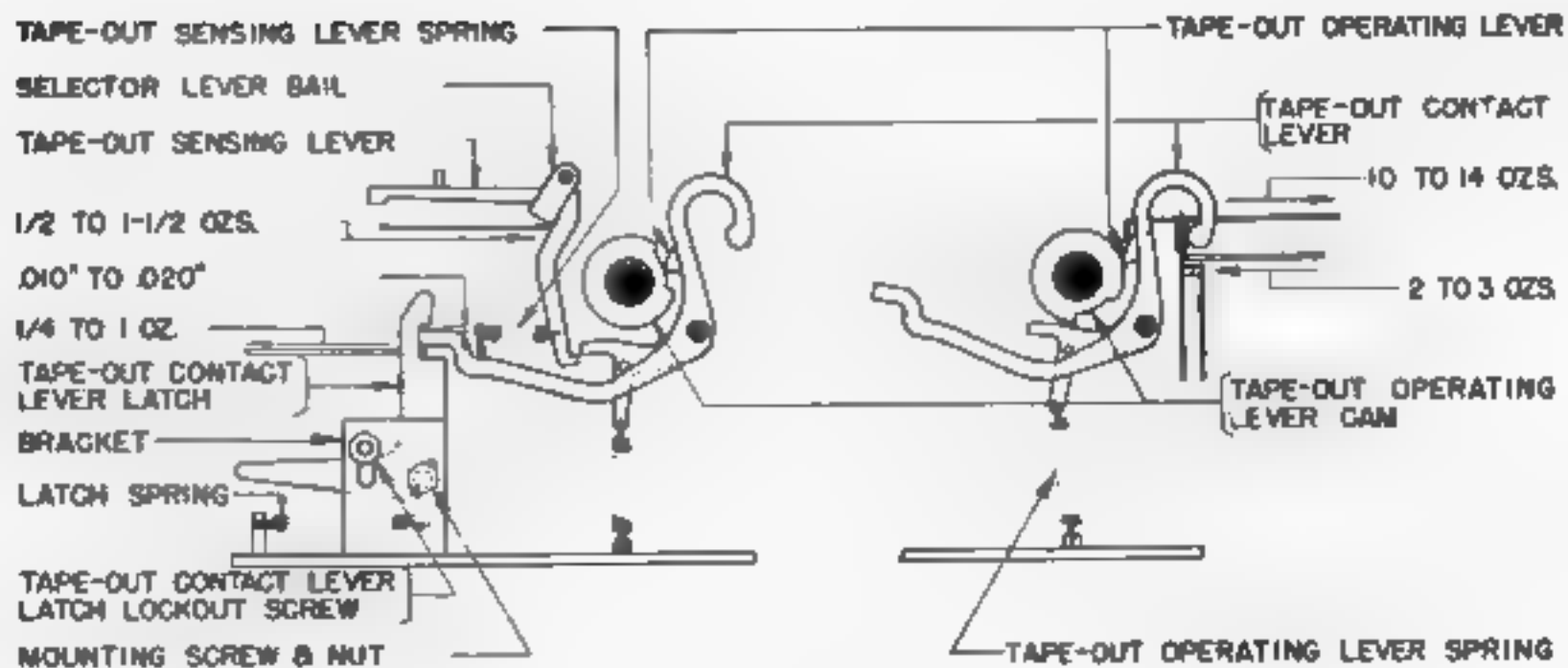


(A)



(B)

FIGURE 8



(A)

(B)

FIGURE 9

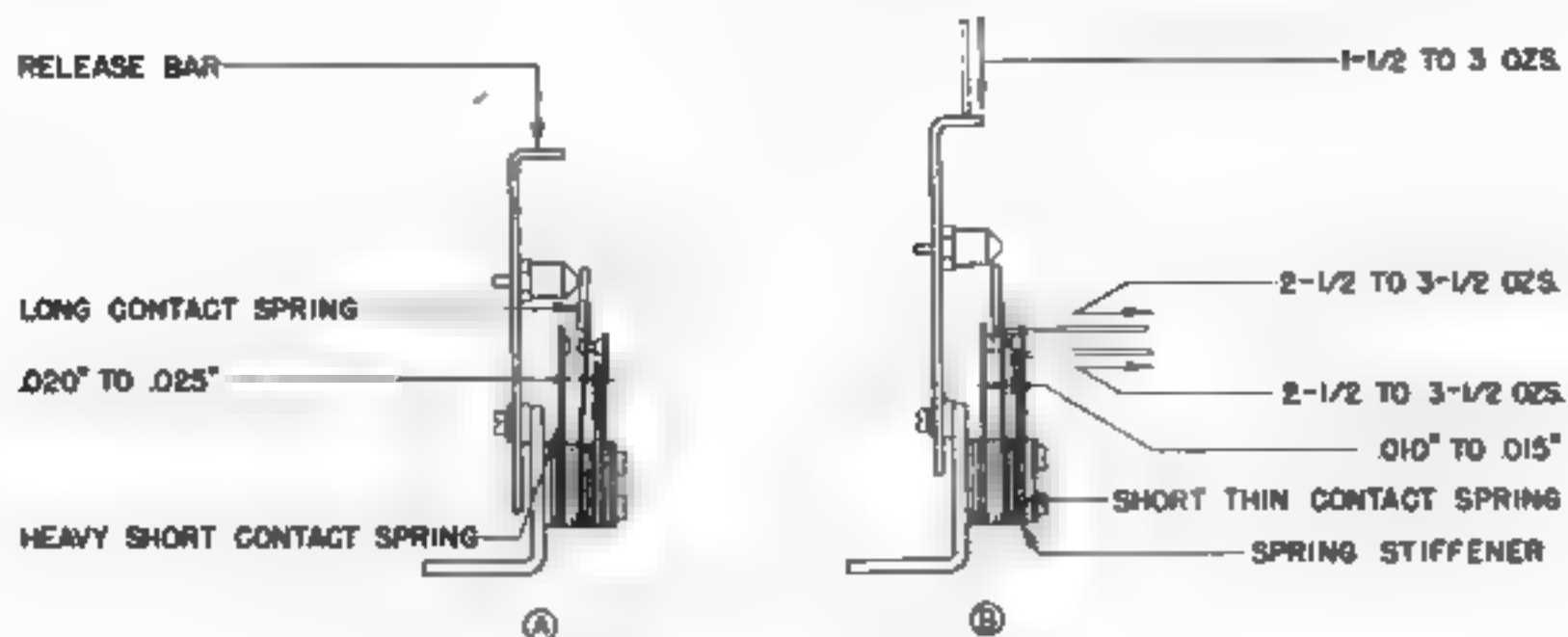


FIGURE 10

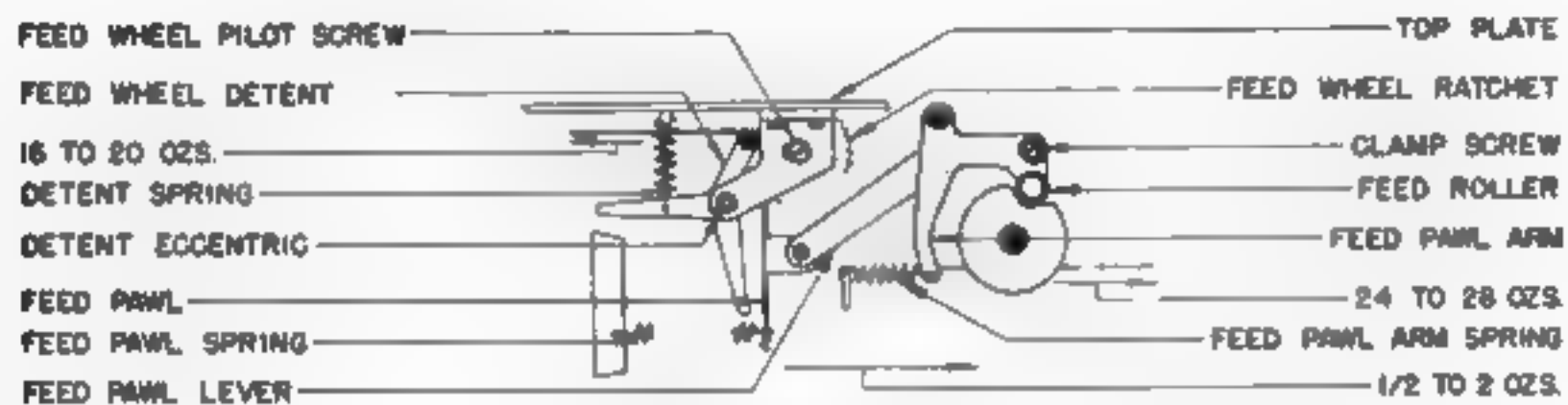


FIGURE 11

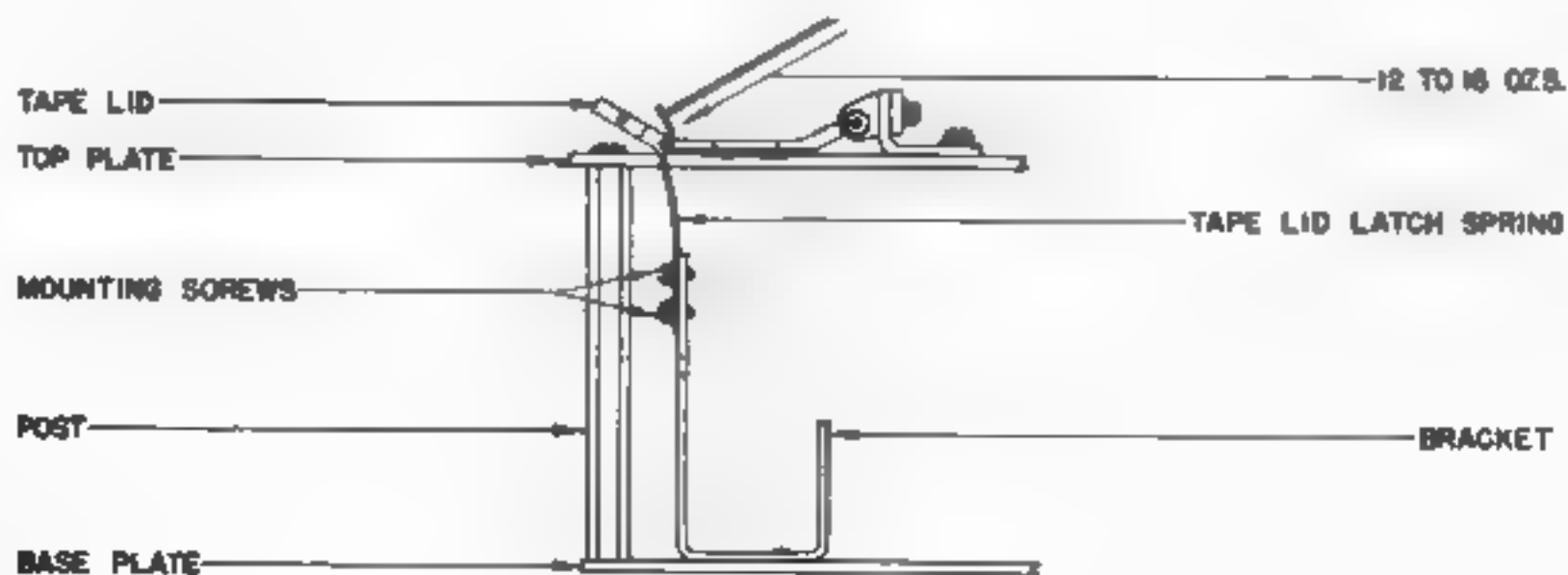


FIGURE 12

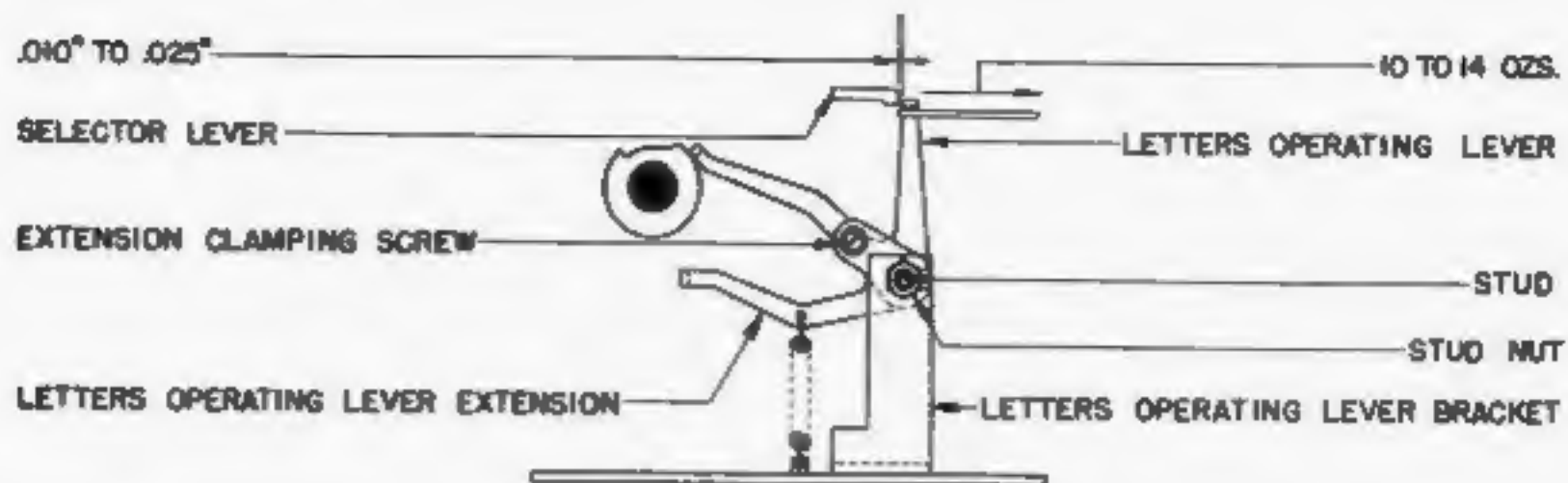


FIGURE 13

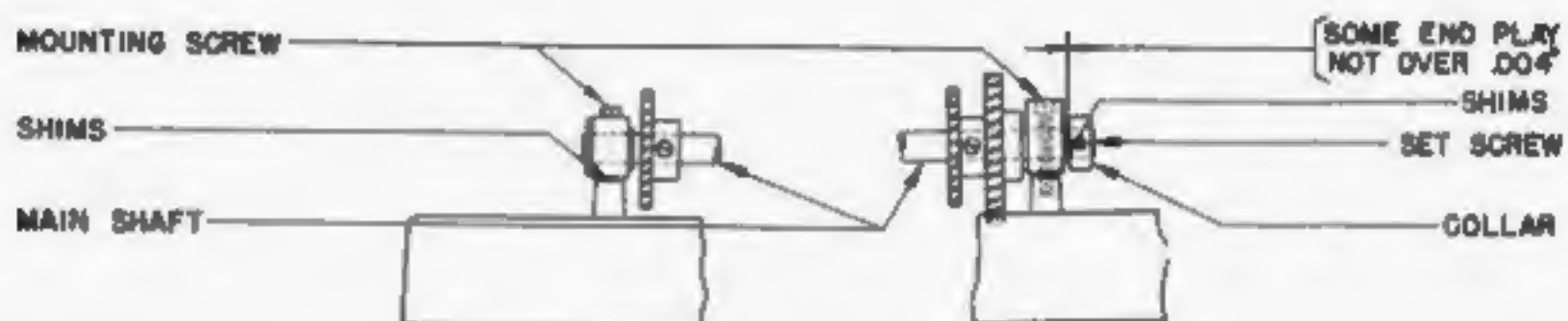


FIGURE 14

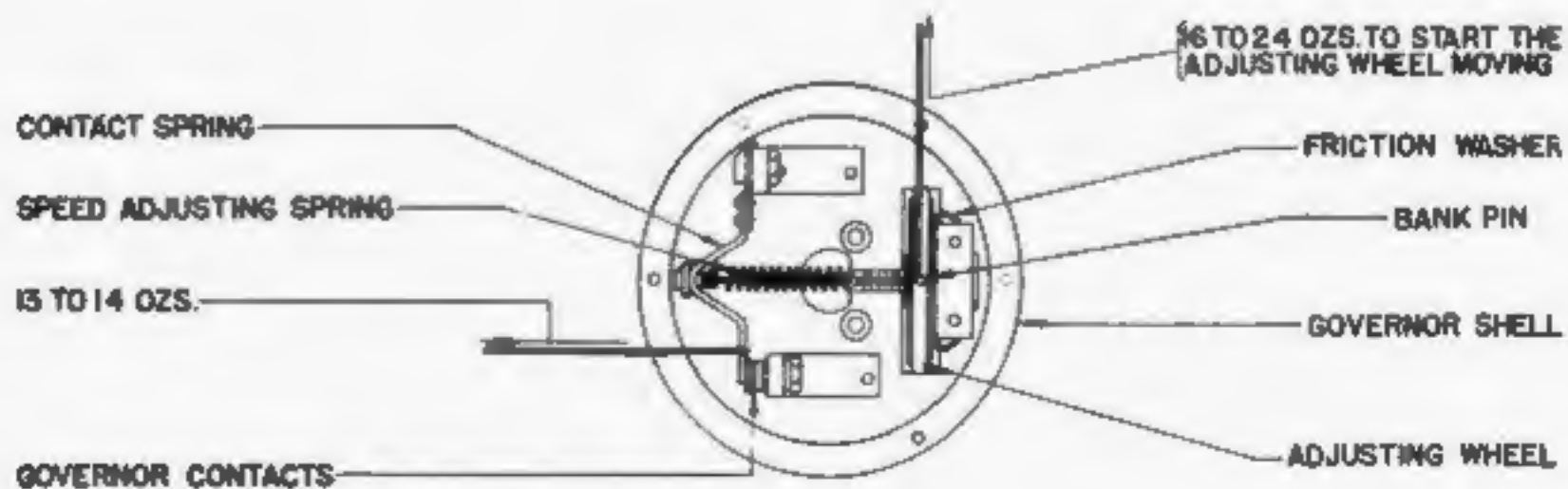


FIGURE 15

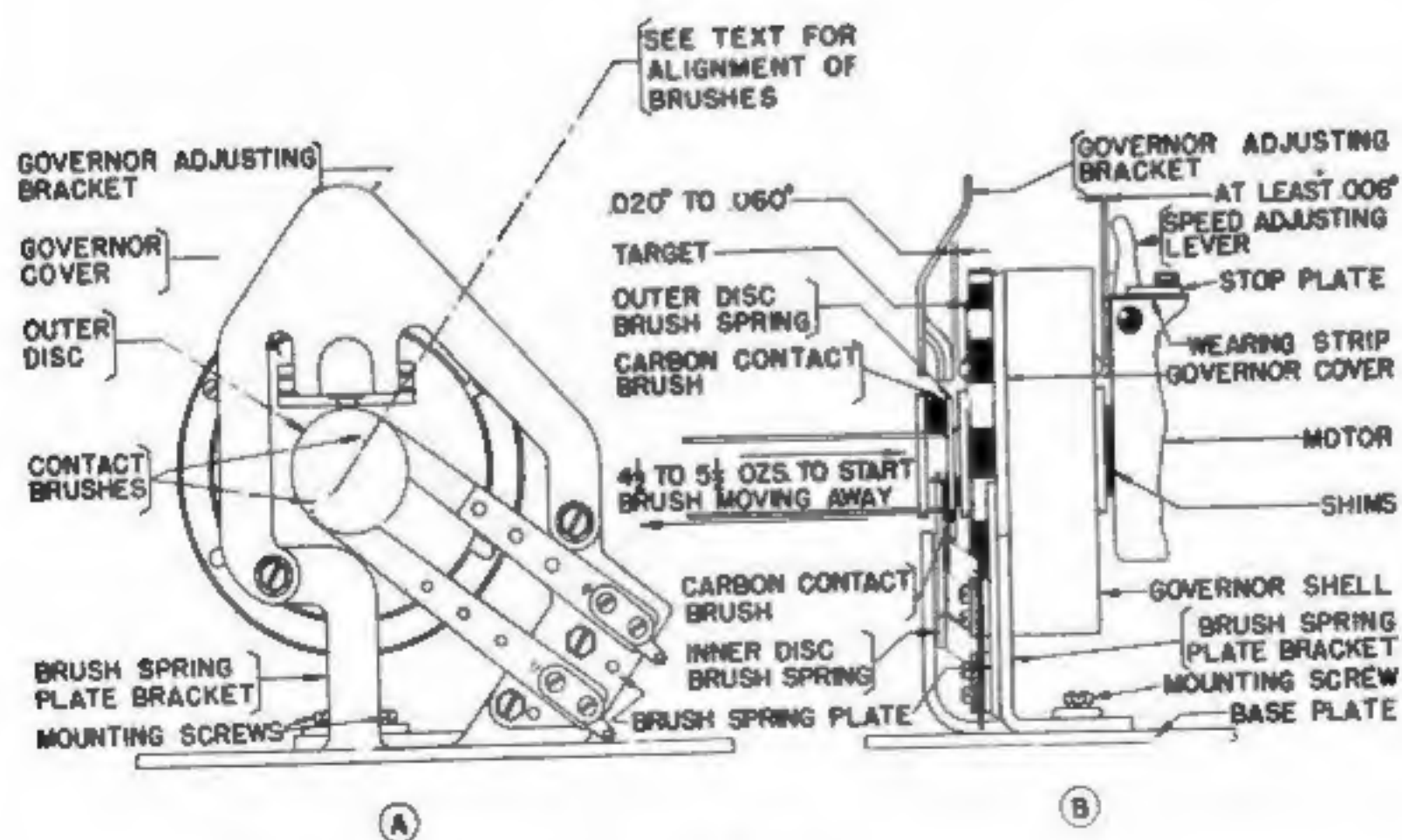
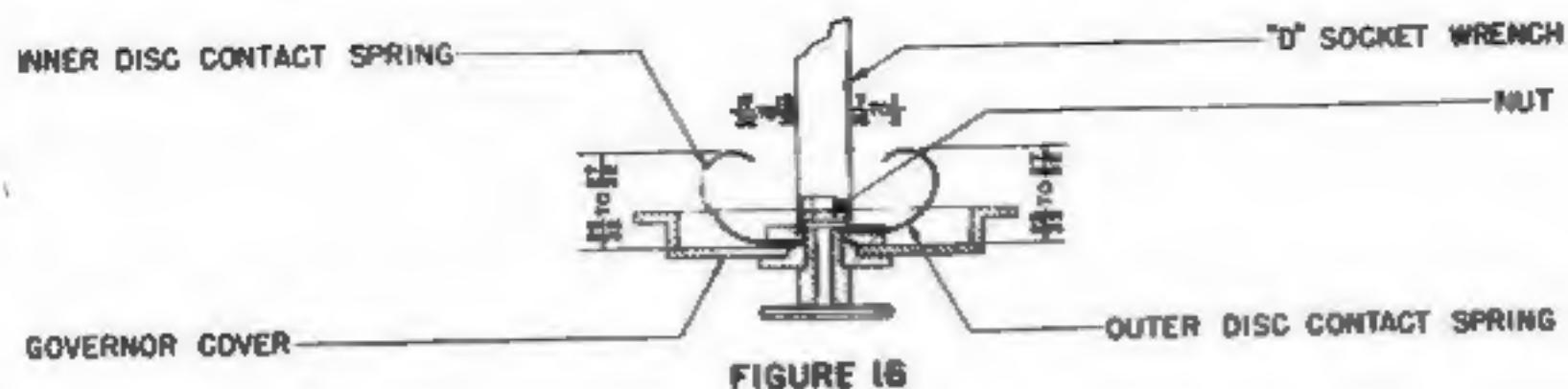
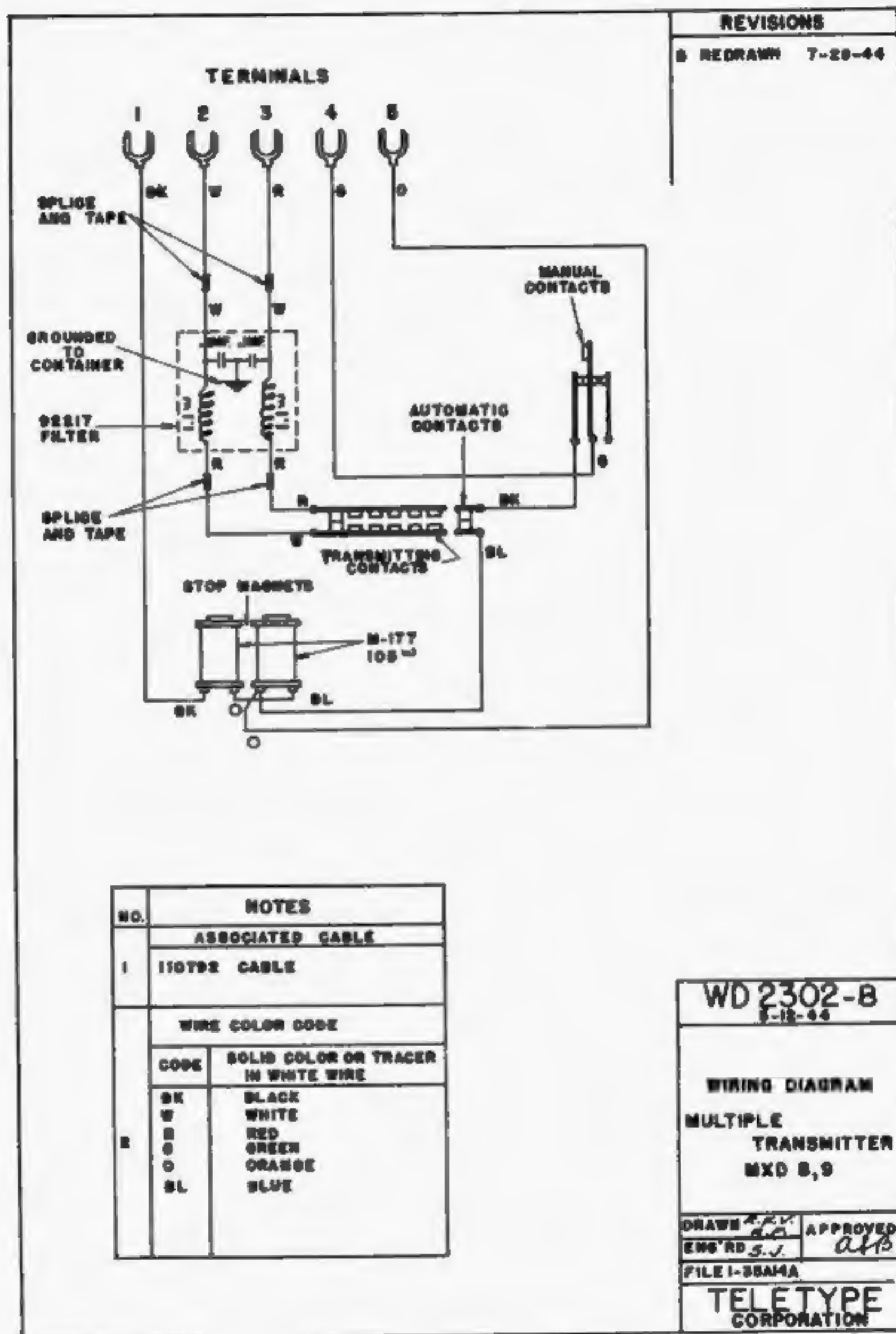


FIGURE 17

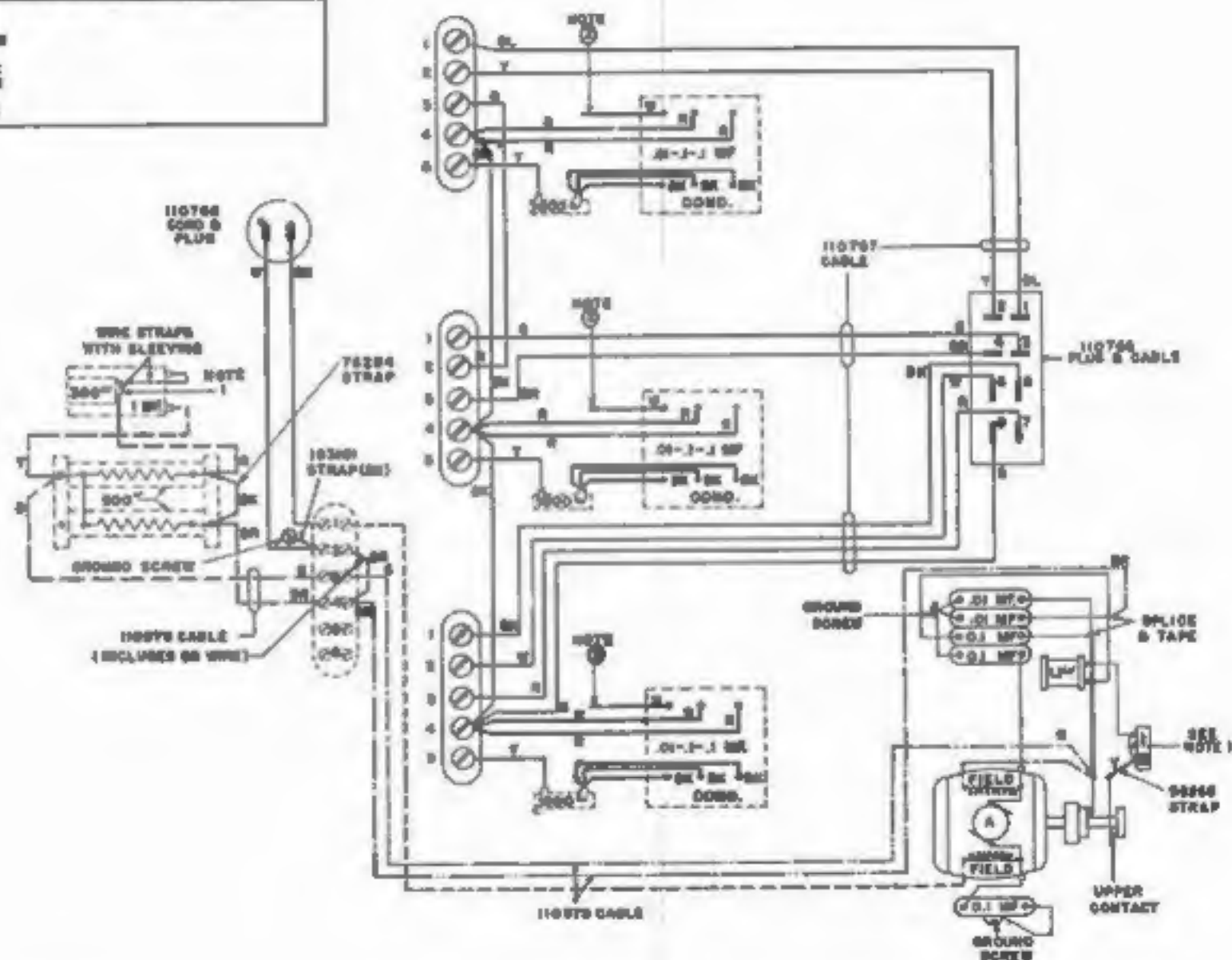


NO.	NOTES	
1	ASSOCIATED CABLE	
	110792 CABLE	
2	WIRE COLOR CODE	
	CODE	SOLID COLOR OR TRACER IN WHITE WIRE
	BK	BLACK
	W	WHITE
	R	RED
	G	GREEN
	O	ORANGE
	BL	BLUE

WD 2302-B 5-12-44	
WIRING DIAGRAM MULTIPLE TRANSMITTER MXD 8,9	
DRAWN <i>[Signature]</i> ENG'D <i>[Signature]</i>	APPROVED <i>[Signature]</i>
FILE 1-35A4A	
TELETYPE CORPORATION	

NO.	NOTES																	
1	FOR D.C. OPERATION, REMOVE SHUNT FROM 10 ³ AND 300 ^Ω RESISTORS.																	
2	CNT LEADS 2" LONG AND TAPE ENDS																	
3	ASSOCIATED CABLES																	
	----- MOTOR LEADS																	
	----- 110878 80V. CN. CABLE																	
	----- 110787 POWER CABLE																	
	----- FILTER LEADS																	
	----- 110878 MOTOR CABLE																	
4	WIRE COLOR CODE																	
	<table border="1"> <thead> <tr> <th>CODE</th><th>WIRE COLOR OR STRAP</th></tr> </thead> <tbody> <tr><td>W</td><td>WHITE</td></tr> <tr><td>G</td><td>GREEN</td></tr> <tr><td>Y</td><td>YELLOW</td></tr> <tr><td>R</td><td>RED</td></tr> <tr><td>BL</td><td>BLACK</td></tr> <tr><td>BR</td><td>BROWN</td></tr> <tr><td>BLU</td><td>BLUE</td></tr> <tr><td>S</td><td>SLATE</td></tr> </tbody> </table>	CODE	WIRE COLOR OR STRAP	W	WHITE	G	GREEN	Y	YELLOW	R	RED	BL	BLACK	BR	BROWN	BLU	BLUE	S
CODE	WIRE COLOR OR STRAP																	
W	WHITE																	
G	GREEN																	
Y	YELLOW																	
R	RED																	
BL	BLACK																	
BR	BROWN																	
BLU	BLUE																	
S	SLATE																	

REVISIONS:	
D REDRAWN	7-28-44
D B-14-44	33025



WD-2301-D
8-12-44

WIRING DIAGRAM
MULTIPLE
TRANSMITTER
DISTRIBUTOR BASE
MX28

DRAWN C.E.W. APPROVED
J.H.W. S.A. *[Signature]*
FILE 1-38.2.15.2

TELETYPE
CORPORATION